

What is claimed is:

1. A communication system comprising a master node and a plurality of slave nodes, and the system in which the master node and slave nodes communicate with one another, wherein the

5 master node comprises:

a clock transmission means for transmitting a clock signal to the plurality of slave nodes;

a means for transmitting a group of communication selection signals, which signifies whether each slave node is selected  
10 as a party of signal transmission to or from the master node and which signifies a direction of communication, to the slave nodes;

a means for transmitting data to the plurality of slave nodes synchronously with the clock signal; and

15 a means for receiving data sent from a selected slave node synchronously with the clock signal.

2. The communication system according to Claim 1,

wherein the group of communication selection signals  
20 includes a first selection signal signifying whether each slave node is selected as a receiver of signal transmission from the master node, and a second selection signal signifying whether each slave node is selected as a sender of signal transmission to the master node; and

25 the second selection signal is used to select at most one

slave node on a simultaneous.

3. The communication system according to Claim 1,

wherein the group of communication selection signals  
5 includes a first selection signal signifying whether each slave  
node is selected as a party of signal transmission to or from  
the master node, and a second selection signal signifying a  
direction of signal transmission between the master node and  
the slave node.

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4. The communication system according to Claim 1, wherein  
each of the slave nodes comprises:

a means for, when the group of communication selection  
signals selects the slave node as a party of transmission from  
15 the master node, receiving transmission data sent from the master  
node synchronously with the clock signal; and

a means for, when the group of communication selection  
signals selects the slave node as a party of transmission to  
the master node, sending transmission data to the master node  
20 synchronously with the clock signal.

5. Control device comprising a master node, a plurality of  
slave nodes, actuators connected to the respective slave nodes  
via respective switching means, and a communication system in  
25 which the master node and the slave nodes are communicated with

one another, and the control device which controls the actuators in response to a instruction issued from the master node,

wherein, the master node comprises:

a clock transmission means for transmitting a clock signal  
5 to the plurality of slave nodes;

a means for transmitting a group of communication selection signals, which signifies whether each slave node is selected as a party of signal transmission to or from the master node and which signifies a direction of communication, to the slave  
10 nodes;

a means for transmitting data to the plurality of slave nodes synchronously with the clock signal; and

a means for receiving data sent from a selected slave node synchronously with the clock signal;

15 wherein each of the slave nodes comprises:

a means for, when the group of communication selection signals selects the slave node as a party of transmission from the master node, receiving transmission data sent from the master node synchronously with the clock signal; and

20 a means for, when the group of communication selection signals selects the slave node as a party of transmission to the master node, sending transmission data to the master node synchronously with the clock signal.

25 6. The control device according to Claim 5,

wherein the group of communication selection signals includes a first selection signal signifying whether each slave node is selected as a receiver of signal transmission from the master node, and a second selection signal signifying whether each slave node is selected as a sender of signal transmission to the master node; and

the second selection signal is used to select at most one slave node on a simultaneous.

7. The control device according to Claim 5, wherein the group of communication selection signals includes a first selection signal signifying whether each slave node is selected as a party of signal transmission to or from the master node, and a second selection signal signifying a direction of signal transmission between the master node and the slave node.

8. An information processing system comprising a master node which includes a microprocessor and performs information processing, a plurality of slave nodes each of which includes a microprocessor and performs information processing, and a communication system in which the master node and the slave nodes communicate with one another, wherein the master node comprises:

a clock transmission means for transmitting a clock signal to the plurality of slave nodes;

a means for transmitting a group of communication selection signals, which signifies whether each slave node is selected as a party of signal transmission to or from the master node and which signifies a direction of communication, to the slave nodes;

a means for transmitting data to the plurality of slave nodes synchronously with the clock signal; and

a means for receiving data sent from a selected slave node synchronously with the clock signal;

wherein each of the slave nodes comprises:

a means for, when the group of communication selection signals selects the slave node as a party of transmission from the master node, receiving transmission data sent from the master node synchronously with the clock signal; and

a means for, when the group of communication selection signals selects the slave node as a party of transmission to the master node, sending transmission data to the master node synchronously with the clock signal.

9. The information processing system according to Claim 8, wherein the group of communication selection signals includes a first selection signal signifying whether each slave node is selected as a receiver of signal transmission from the master node, and a second selection signal signifying whether each slave node is selected as a sender of signal transmission

to the master node; and

the second selection signal is used to select at most one slave node on a simultaneous.

5 10. The information processing system according to Claim 8, wherein the group of communication selection signals includes a first selection signal signifying whether each slave node is selected as a party of signal transmission to or from the master node, and a second selection signal signifying a  
10 direction of signal transmission between the master node and the slave node.

11. Real-time control device comprising a main node for determining output timings and output waves, and a plurality  
15 of I/O nodes for transmitting outputs with respective output waves at respective output timings,

the control device further comprising:

a common serial channel through which the main node and the plurality of I/O nodes are connected to one another; and  
20 individual signal lines through which the main node and the respective I/O nodes are connected to each other,

wherein information of the output timings determined by the main node are transmitted from the main node to the plurality of I/O nodes through the individual signal lines; and

25 information of the output waves determined by the main

node are transferred from the main node to the plurality of I/O nodes through the common serial channel.

12. The real-time control device according to Claim 11,  
5 wherein the main node comprises a microprocessor unit for determining the output timings and the output waves, a serial communication interface via which the information of the output waves are transmitted, and a timer for producing the output timing information.

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13. The real-time control device according to Claim 11,  
wherein the main node comprises a means for transmitting an I/O node selection signal that signifies whether each I/O node is designated as a party of transmission to or from the  
15 main node, and a means for producing a transmission clock; and  
the main node transmits data synchronously with the transmission clock; and

when an I/O node selection signal with which each I/O node is designated is active, the selected I/O node transmits data  
20 synchronously with the transmission clock.

14. The real-time control device according to Claim 11,  
wherein the main processor and I/O nodes are connected to one another owing the communication system set forth in Claim 1,  
25 the main processor corresponds to the master node, and the I/O

nodes correspond to the slave nodes.